FAA | AVIATION NEWS

JULY 1962

F E D E R A L A V I A T I O N A G E N C Y

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FEDERAL AVIATION AGENCY

JULY 1962

NATIONAL AIRPORT PLAN—1962

A five-year pattern for development of a national airport system to handle rapidly growing civil aviation activity in the United States is laid out in the 1962 National Airport Plan (*see* p. 10). This is the FAA's annual projection of airport needs, developed at the direction of Congress.

The plan simply tells what improvements should be made to existing airports and what new airports will be needed to accommodate aviation growth. It is a planning document, not a request for appropriations or an allocation of funds.

Communities across the nation ought to consult this report to determine their role in developing a truly adequate national airport system. It contains guides for responsible civic planning to provide facilities in time to handle aviation growth on time—not long after an airport complex is jammed with traffic.

Airmen should consult it, too. Community awareness of airport needs and benefits is essential to aviation progress. Local airmen must join with all of aviation in a determined effort to generate their community's support, for without local support an airport cannot be successful. The National Airport Plan is a useful tool in this campaign.

The FAA is emphasizing the current need for more general aviation airports to relieve congestion in major terminal areas. The 250 new airports recommended for this purpose would serve the interest of all airmen. They would relieve the traffic headaches of airline and general aviation pilots at major airports, and they would provide new facilities tailored to general aviation operations.

Airports are a growing problem to aviation, both in terms of preserving present facilities from real estate encroachment and of providing needed new airfields. The National Airport Plan is a useful guide to solutions. But only long, hard work by the whole aviation community will finally solve the problems of this major link in the national aviation system.

NOTE TO READERS

After this issue, complimentary copies of *FAA Aviation News* will no longer be distributed to the public through FAA facilities. Subscriptions, at $1.50 a year, are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

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COVER: *To determine accuracy of altimeters, FAA technicians conducted air-ground altimeter checks at a three-day general aviation meeting last month at Reading, Pa. (see page 3) They photographed airplanes overhead to provide precise filmed measurement of altitude for comparison with altimeter readings.*

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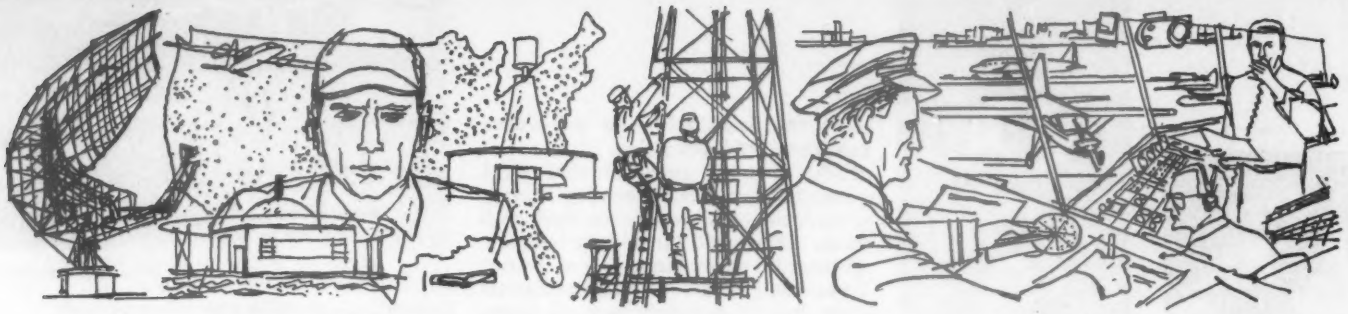


FAA RE-EMPHASIZES MAINTENANCE SAFETY PROGRAM FOR GENERAL AVIATION

Improved maintenance "to increase the safety of general flying" and a new system of manufacturer-servicing for aircraft were urged last month by FAA Administrator N. E. Halaby.

"Keeping our general aviation fleet in the air is a big order. By and large, it has been well done, but I don't think that leaves any room for complacency," Halaby told the Reading (Penna.) Aviation Service's 13th National Maintenance and Operations Meeting.

"In 1961, there were 415 fatal accidents that killed 760 people in the light fixed-wing category of aircraft," he said. "The total number of accidents in that category was almost 4,500. The record of heavy fixed-wing aircraft was a good deal better, with 11 fatal accidents and 17 fatalities, but that is still too many.

"Investigation indicates that about 80 percent of these accidents are attributable in whole or in part to pilot error. FAA is not complacent about the pilot error problem. We're doing something about it. Nor are we complacent about the fact that possibly 20 percent of all fatal general aviation accidents were the fault of the aircraft or the instrumentation."

Three-Part Program

The Administrator said a three-part effort would be initiated to improve general aviation maintenance standards:

"First, we're emphasizing safety programs, stressing technical competence. Second, we find unacceptable that idea of one safety standard for the carriers, who incidentally had their third safest year in history last year, and another standard for general aircraft. We want to eliminate any difference in standards that may exist. Third, we want to help maintenance airmen increase their skills as much as possible by helping develop curricula, texts, training aids and teaching methods."

As part of the over-all safety effort, FAA will soon begin tabulating incidents as well as accidents at the Agency computer facility at the Aeronautical Center in Oklahoma City, Oklahoma.

"Every incident is a potential accident," Halaby said. "The accident figures aren't truly representative of the scope of the problem. I think the results of our incident-tabulation will bear out our contention that none of us can ever feel complacent about air safety. And we've got to do all we can to increase the safety of general flying."

Altimeter Checking

FAA concern with general aviation safety was pointed up by an altimeter-check program conducted through the three-day meeting at Reading by an Agency crew. Both airborne and ground checks were provided, free of charge, for aviators who wished to take part. The checks were part of an FAA altimetry study. They will also provide pilots who took part with valuable diagnoses of the health of their altimeter systems.

Aviators were guided over an FAA camera installation at low altitude by a controller stationed with the camera on the grounds of a drive-in movie theater six miles from Reading Airport. Pictures of aircraft were taken when they were overhead to provide precise visual measurement of altitude. At the same time, the pilot reported altitude as indicated on his altimeter. Most pilots who took part made several passes each over the inverted aerial camera.

On the ground at Reading Airport, a crew checked the altimeter systems of participating aircraft. These crews were provided by the Wright Instrument Company, Vestal, N. Y., which has an FAA contract for checking altimeters, and the Intercontinental Dynamics Corporation, Englewood, N. J., manufacturers of test equipment used.

In all, 42 aircraft flew over the camera. They completed 154 passes. Seventy-five planes were ground-checked. Of these, a surprisingly large number, 57, were informed that their altimeter systems were leaking to a significant degree, enough in some cases to cause major error in indicated altitude when in the air.

Data collected in these checks is being evaluated. Reports of individual results were scheduled to go out to participants within about 30 days of the tests. An over-all statistical summary of results will be announced to the aviation community. Aircraft and owners will not be publicly identified. There will be no penalties for altimeters found providing erroneous readings.

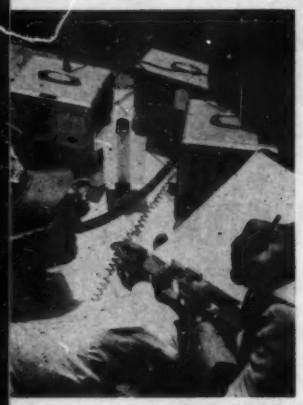
Further air-ground checking of altimeters was expected to be conducted in the immediate future under an FAA program that began three years ago. Work will be conducted with all categories of aircraft and with control tower and repair station equipment. Altimeter studies have previously been performed by FAA personnel in Washington and at the Agency's National Aviation Facilities Experimental Center (NAFEC), Atlantic City, N. J. Work by other government agencies and industry has also been extensive.

Halaby told the Reading audience that he is interested in results attained in the altimeter program within the framework of over-all safety improvement.

FAA Proposals

Turning from the specific subject of safety, Mr. Halaby said that FAA would "like to see general aviation owners and pilots get better, more reliable and more economical service with a minimum of delay. We'd like to do what we can to make the lot of the manufacturer, the dealer and the repair station easier, too."

FAA Administrator N. E. Halaby flew Gulfstream to Reading to address maintenance meeting.



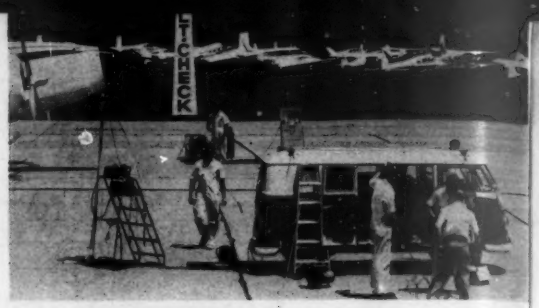
In aerial checks of altimeters, airplanes flew over inverted aerial camera *(above)* which measured altitude while pilots radioed indicated setting to ground *(left)*.

He described three tentative FAA approaches in this area:

"We recently proposed that FAA grant manufacturers the privilege of servicing their own aircraft in their own plants. This would be an important convenience to manufacturer and owner. When the aircraft includes equipment other than the manufacturer's, the manufacturer would have to service it on a repair station certificate.

"Going a step further, we're exploring the feasibility of a new inspection system which would rely primarily on the servicing system of the individual manufacturer. Where an owner maintains his aircraft within the manufacturer's dealer system, this would substitute for the present annual inspection.

"One alternative method would be to require the manufacturer to make standards and shop manuals on his equipment available at cost to general repair station operators. This is commonly done in the automotive industry now. For aircraft whose manufacturers are no longer in business, FAA would write the standards and manuals."



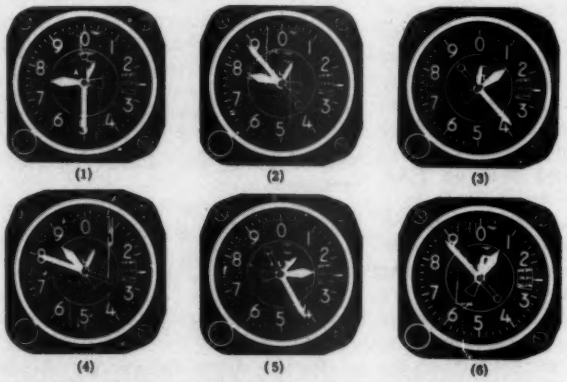
FAA provided free ground calibration of altimeters on request.

TEST YOUR ALTIMETER KNOWLEDGE

Your altimeter is a vitally important instrument. How well do you know it?

Take this short quiz on altimetry. Grade yourself by checking the answers that follow.

1. Check your ability to quickly interpret your altitude by jotting down the readings of the following six altimeters. Allow yourself one minute.



2. Civil Air Regulations require that you maintain your cruising altitudes (VFR as well as IFR) by reference to your altimeter. What do the regulations require concerning the setting (or adjustment) of your altimeter?

3. If you are flying in very cold air (colder than standard temperatures), you should expect your altimeter to read

a) *higher* than your actual altitude above sea level.
b) *lower* than your actual altitude above sea level.
c) *the same* as your actual altitude above sea level.

4. Here are four altitudes with which you should be familiar. Briefly give the meaning of each. (1) Indicated altitude. (2) Pressure altitude. (3) Density altitude. (4) True altitude.

5. Assume that your proposed route crosses mountains with peaks extending to 10,900 feet above sea level. Prior to crossing this range, you adjust the altimeter setting window of your altimeter to the *current altimeter setting* reported by a Flight Service Station located in a valley near the base of this mountain range. If you maintain an indicated altitude of 11,500 feet by your altimeter, *can you be assured of at least 500 feet vertical clearance of these mountain peaks?*

Answers to Questions on Altimetry

1. 1) 7,500 ft. 2) 7,880 ft. 3) 1,380 4) 8,800 ft. 5) 12,420 ft. 6) 880 ft. If your altimeter is the three-pointer-type sensitive altimeter such as those pictured, an orderly approach to reading your altitude is to first glance at the smallest hand (10,000-ft. hand); next read the middle hand (1,000-ft. hand); and last, read the large hand 100-ft. hand). For the two-pointer altimeter, simply read the small hand first and the large hand next.

2. Your altimeter should be set to the *current reported altimeter setting* of a station along the route of flight (Flight Service Stations, Control Towers, etc.). If your aircraft is not equipped with a radio, you should obtain an altimeter setting prior to departure if one is available, or you should adjust your altimeter to the elevation of the airport of departure.

3. If you are flying in cold air, you should expect your altimeter to indicate higher than you actually are. If you are flying from a high pressure area to a low pressure area or into cooler air, you aren't as high as you think—assuming, of course, that no compensations are made for these atmospheric conditions.

4. (1) Indicated altitude—That altitude read directly from the altimeter (uncorrected).
(2) Pressure altitude—The altitude read from the altimeter when the altimeter setting window is adjusted to 29.92. (This altitude is used for computer solutions for density altitude, true altitude, true airspeed, etc.)
(3) Density altitude—This altitude is pressure altitude corrected for nonstandard temperature variations and is directly related to the aircraft's take-off and climb performance.
(4) True altitude—The true height of the aircraft above sea level—the actual altitude. Often you will see a true altitude expressed in this manner: "10,900 ft. MSL"—the MSL standing for Mean Sea Level. Remember that airport, terrain and obstacle elevations found on charts and maps are true altitudes.

5. No, you are not assured of 500 feet vertical clearance with these mountains. As a matter of fact, with certain atmospheric conditions, you might very well be 500 feet *below* the peaks with this indicated altitude. To begin with, 500 feet is hardly an adequate separation margin to allow on flights over mountainous terrain—1,500 to 2,000 feet is recommended in order to allow for possible altitude errors and downdrafts.

A majority of pilots confidently expect that the current altimeter setting will compensate for irregularities in atmospheric pressure. Unfortunately, this is not always true. Remember that the altimeter setting broadcast by ground stations is the *station pressure corrected to Mean Sea Level.* It does not reflect distortion at higher levels, *particularly the effect of nonstandard temperature.*

When flying over mountainous country, allow yourself a generous margin for terrain and obstacle clearances.

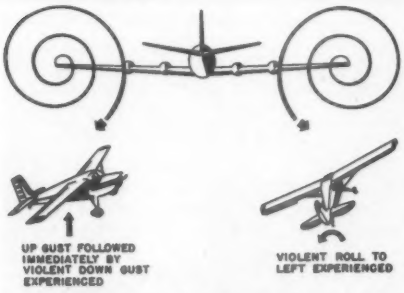
Pilots Warned of Turbulence Caused by Wake of Large Planes

General aviation pilots should avoid the hazards of flying in the wake of large jet and propeller-driven airplanes.

The heavy turbulence kicked up by these airplanes was at least a contributing cause in several general aviation accidents last year, some involving fatalities.

In the past, the term "prop wash" generally was applied to this phenomenon, but the propeller has been found to be only partially responsible. Most of the turbulence is generated by air passing over and around the wing tips, resulting in a highly disturbed condition at each wing tip identified as a vortex.

Severity of the turbulence is directly proportional to the loading of the wing and inversely proportional to the speed and wing span. Thus a heavy transport leaves the most severe turbulence at slow speeds—immediately after takeoff or just before landing.



The turbulence has been compared to an "invisible horizontal tornado" and it can be severe enough to inflict serious structural damage on light aircraft or otherwise adversely affect control of a plane. It is not known how long the effects of turbulence are hazardous, but wind is an important factor in its dissipation. On a blustery day, for example, turbulence will disappear more rapidly than in calm weather.

Since slow-flying aircraft leave the most violent wakes, the areas around airport runways present the greatest potential danger. The hazards are increased by the need to remain within rather narrow corridors on takeoffs and landings.

As a precautionary measure, pilots of light planes should not follow another aircraft too closely and should fly, whenever possible, on the upwind side of its track. They also should avoid crossing the wake of a large aircraft until they judge it has had time to dissipate. This time will vary with the speed and size of the aircraft and weather conditions.

In addition, a pilot who has been cleared for takeoff behind another airplane has the option to request additional delay if he suspects wake turbulence exists. This request should be made prior to taxiing into position on the runway.

Pilots are further cautioned about helicopter turbulence. They should fly above the flight path of a helicopter to avoid its wake.

Government, Industry to Discuss Midair Collision Prevention

FAA's government-industry Collision Prevention Advisory Group (COPAG) will sponsor a two-day symposium this month on airborne equipment to help prevent midair aircraft collisions.

The symposium will be held on July 12 and 13 at the Mayflower Hotel in Washington.

A broad cross-section of the aviation and electronic industries has been invited to participate. They will review research and development work in the anti-collision area, outline accomplishments to date and discuss future development plans and programs. FAA began a research and development program for both light and heavy aircraft at the end of 1958. Rudimentary experimental equipment has undergone extensive airborne tests.

COPAG includes members from FAA, the National Aeronautics and Space Administration, the military services, the Aircraft Owners and Pilots Association, the Air Transport Association, the National Business Aircraft Association, the National Pilots Association and the Air Line Pilots Association.

Michigan to Survey Aviation's Economic Value to the State

A comprehensive survey of aviation activity in Michigan, designed to demonstrate its economic value, is scheduled for July 28 to August 3 at all 136 licensed airports.

The survey, "Michigan Aviation Fact Finder," is sponsored by the Michigan Department of Aeronautics with the cooperation of the FAA, the Weather Bureau, various airlines, the Civil Air Patrol and other organizations.

Data compiled in the survey will be used to justify continued improvement of Michigan's aviation facilities.

Announcing the survey, the department pointed out that Michigan's airport system was largely developed through the use of local, State and Federal funds. But when the State Legislature and local governing bodies are faced with a request for airport improvement funds, they seek information about aviation and its importance to their community. Frequently, many answers are unavailable. The survey hopes to fill this gap.

About 2,000 volunteer interviewers will seek such information as:

- Aircraft utilization and equipment,
- Aircraft origin, destination and common routes,
- Hours flown for business and pleasure,
- Money spent by air travelers in each community,
- An airport's economic contribution to the community,
- Revenue received from itinerant flights.

Exterior Lighting Tests to End

A special regulation permitting airlines and other operators to try new exterior lighting concepts on aircraft with standard airworthiness certificates has been terminated by the FAA.

The regulation (SR-392C) expired on June 25, but operators will have at least a year to phase out experimental systems installed prior to that date. About 100 airplanes are presently equipped with non-standard exterior lights.

More than 10 years of experimentation under SR-392C and previous regulations have not produced a proven experimental lighting arrangement surpassing the standard system now prescribed.

For the most part, reports submitted by experimenters contain subjective evaluations of proposed systems without the use of experimental controls to insure a valid basis for comparison. Tests and studies conducted by the Navy Department and by the Agency have not corroborated the advantages claimed by private experimenters.

The FAA also pointed out that termination of the regulation would not prevent new lighting experimentation, since tests still can be performed under an experimental airworthiness certificate.

PUBLICATIONS AVAILABLE

Flight Standards Release 456—Rules for certification and operation of amateur-built aircraft. Free.

16th Annual Report of Operations—Federal Airport Plan. Free.

Inquiry Section, MS-126
Federal Aviation Agency
Washington 25, D. C.

Air Transport's Next Great Step—Supersonic Travel (reprinted from May, 1962 *Aerospace*). Free.

Office of Public Affairs
Federal Aviation Agency
Washington 25, D. C.

BLUE SEAL PROGRAM SPURS INSTRUMENT TRAINING

The Federal Aviation Agency's Blue Seal program has substantially raised pilot incentive to acquire at least limited instrument flight capability.

Reports indicate pilots are showing increasing interest in the Blue Seal certificate and, more important, the program is credited with greatly stimulating interest in flight safety.

Approximately 12,000 Blue Seals were issued during the first six months of the program. This number is expected to increase sharply during the next six months when flying conditions are much more favorable.

There also is evidence that airmen are using the Blue Seal program as a stepping stone in obtaining full instrument ratings. The number of pilots in training for instrument flight ratings currently is up about 25 percent. FAA officials believe that the program is at least partially responsible for the increase.

No conclusive statistics are available concerning the impact of the program on aviation safety. The FAA believes, however, that persuading airmen to obtain at least minimum skill with instruments will reduce the number of accidents caused by bad weather. This accounts for about 30 to 35 percent of fatalities in general aviation.

The FAA initiated the Blue Seal program last October as a means of improving the skills of private pilots. It is designed to encourage them to acquire enough instrument skill to fly out of a potentially dangerous weather or visibility situation encountered inadvertently.

The Blue Seal confers no special privileges. While it increases pilot competence, it does not convey the ability or authority to make intentional IFR flights.

Student pilots now receiving instruction will find included in their training the necessary skills to qualify for the Blue Seal. This is required in Civil Air Regulation 20.35 (b), which became effective May 16, 1960. Pilots who received their original certificates on or after that date also are eligible, as are pilots who already hold an instrument rating.

Other holders of private pilot certificates wishing to receive the Blue Seal can do so by demonstrating their instrument capability to an FAA inspector or a designated pilot examiner. Those with sufficient experience to qualify without demonstration should present logbooks or other evidence of their ability.

In addition, the FAA will recognize graduates of the Aircraft Owners and Pilots Association 360 Degree Instrument Rating Course as eligible for the Blue Seal. The association is urging all non-instrument rated pilots among its 75,000 members to take the course.

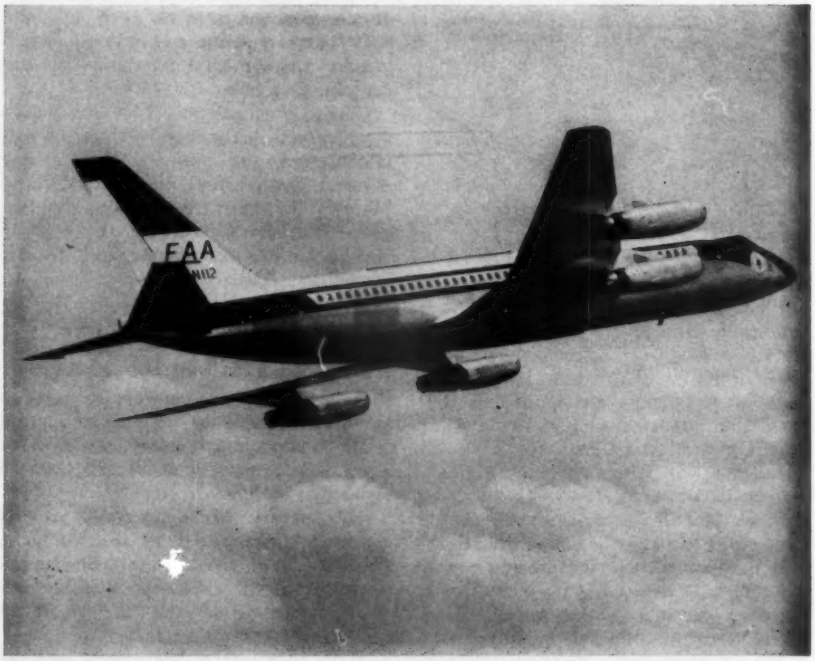
Similarly, the State of Tennessee is offering a course to qualify airmen for the Blue Seal. Several other states and organizations also have expressed interest in such a program.

FAA ELIMINATES LIMITED FLIGHT INSTRUCTOR RATING

All flight instructors are eligible for a full-fledged rating since removal of the limited flight instructor classification from Part 20 of the Civil Air Regulations last month.

Changeover from limited to full-fledged flight instructor is virtually automatic. The former "limiteds" no longer have to train five students to the satisfaction of an FAA inspector before getting the full rating. They must, however, exchange the limited certificates for full certificates prior to the two-year limited certificate expiration dates. Limited instructors who fail to make the exchange before their certificates expire may be required to demonstrate their competence before being given the flight instructor certificate.

After several years operating experience with the two classifications of flight instructors, the FAA found that the examinations and tests given to potential flight instructors are adequate to determine an applicant's ability to give proper flight instruction. It is not necessary to evaluate his students as a requisite for an unlimited flight instructor certificate.



On the job *One of the latest airplanes to join FAA's working fleet is this Convair 880. It is used for training Air Carrier Inspectors in order to familiarize them with the airplane in preparation for their work with airlines operating the 880. The 880, like most FAA airplanes, is based at the Aeronautical Center in Oklahoma City.*

FAA-Industry Effort:

IMPROVE AGRICULTURAL AIRCRAFT SAFETY

The fatal accident rate in aerial application, running more than 75 percent higher than that for all general aviation, has spurred a joint FAA-industry effort to make this type of flying safer.

Since 1952, accidents in aerial application work have averaged more than 300 a year with 12 to 16 percent resulting in deaths. In 1959 and 1960 alone, there were 632 such accidents, and 93 of these involved fatalities.

To cut down these accidents, work currently is being carried on in a number of areas, including development of aircraft designed especially for crop dusting and research on helmets and safety harness for greater pilot protection. Tests also are being run on the effects of various pesticides on crop duster pilots and crews.

In addition, the FAA is in the process of drafting proposed rules to require greater operating safety in aerial application work. These rules would cover both commercial and private operators. They are expected to be ready for industry comment this summer.

Despite the many hazards involved. aerial application has boomed since the end of World War II. Its success in controlling weeds, insects and plant disease has made possible tremendous increases in the nation's farm yield.

Growth has been especially strong during the past decade. The acreage sprayed or dusted increased from 37 million in 1952 to 52 million in 1960. The number of flying hours jumped accordingly. in 1960, 4,100 pilots and 5,100 aircraft logged 890,000 hours in the air. California and Texas lead all other States by a wide margin, both in acreage treated and number of accidents.

Insect control remains the primary job of aerial applicators, accounting for approximately 65 percent of the total acreage treated. Weed control ranks second, followed by defoliation, fertilization, seeding, brush control and plant disease control.

Aerial application aircraft also find occasional employment in more exotic tasks such as agitating cherry trees. Here, the planes fly very low over the orchards to dry off any moisture that might have collected on the fruit. This prevents the sun from blemishing or bursting the skins. A similar job is antifrost agitation, which requires low-level flights over citrus crops during the blossom stage, to keep cold air from settling and nipping the buds.

This "on-the-deck" flying coupled with the need for quick tight turns and sharp pullups have made it an accident-prone occupation. This flying contributed to 120 collision accidents in 1959. The majority of these were with wires, poles and trees.

Moreover, the aircraft are frequently overloaded, posing an added danger. In 1959, there were 71 stall accidents, most of them due to overloading. Twenty of these accidents involved fatalities.

In an effort to provide safe equipment for duster pilots, FAA's Civil Aeromedical Research Institute (CARI), located at the Aeronautical Center in Oklahoma City, has already begun preliminary work on improving crash helmets. A full-scale project is scheduled to begin next year under the direction of the Agency's Aviation Medical Service.

Helmets presently in use have several major drawbacks. They do not afford pilots adequate protection against hard head knocks. They also create considerable wind drag in an open cockpit. In addition, the green visor used in military helmets has been found unsuitable for low-level flights because of poor ground definition set up by the cancellation effect of green against green.

Future helmets will provide a strong, light shell around the pilot's head and will probably contain a built-in respiratory system to guard against poisonous substances present in some pesticides. Aluminum, nylon and fibre glass are being tested for the outer shell, while crushable foam or aluminum honeycomb currently are considered the most probable materials for the protective interior.

Similarly, experiments with seat belts have revealed that they are generally ineffective in preventing crash injuries without the addition of a shoulder harness. CARI researchers, however, point out the importance of accurately fitting the harness to the pilot. A too-tight fit, for example, could bring a vertical impact capable of crushing the pilot's spine in the event of an accident.

Aircraft design also has made progress, with several airplanes being developed especially for aerial application work. One example is the Piper Pawnee, a low-wing craft with a cockpit situated well above the fuselage. This gives pilots a much greater periphery of vision on low-level flights than planes currently in use.

The single-engine biplane is the most common type of aircraft used today, logging more than half of the total flight hours. Most of the remaining flight time is registered by high-wing monoplanes, while low-wing craft account for only a nominal percentage.

In the field of toxicity, medical research teams have run numerous test series to determine the effects of various sprays on pilots and ground crews. As a result, an educational campaign has been launched to alert FAA flight surgeons and persons engaged in aerial application work to the specific symptoms of chemical poisoning. Decontamination proceedings also have been taught all aerial application crews.

Liquid pesticides have been found to be potentially more dangerous than dry ones. Despite the use of proper clothing and respirators that prevent most ill effects in handling dry chemicals, liquid sprays still can seep into the pilot's or handler's system with serious effects.

CARI researchers presently are working with manufacturers on the development of a more effective respirator system to cut incidents of illness attributable to economic poisons. Such illness can lead to pilot error on low-level flights and accidents.

But despite all these efforts, aerial application will remain one of the more exacting forms of flying, requiring a high degree of piloting skill. However, the FAA hopes that improving equipment and working environment and requiring operation under safe conditions will reduce the dangers inherent in this highly demanding occupation.

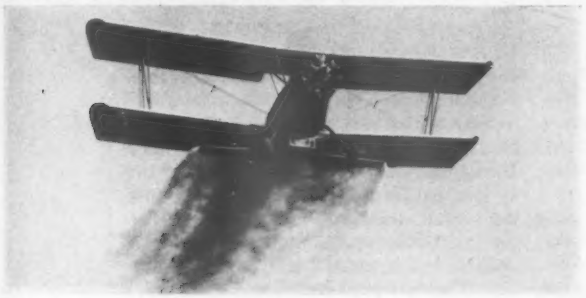
Piper Pawnee incorporates many safety features: shoulder harness, wire cutters on landing gear, battery in tail of fuselage, 62 mph stalling speed at maximum gross weight.

Researchers at FAA's Civil Aeromedical Research Institute examine one of the improved helmets being used by aerial applicators. In a profession where the accident rate is high, safety equipment tailored to the exacting job is extremely important.

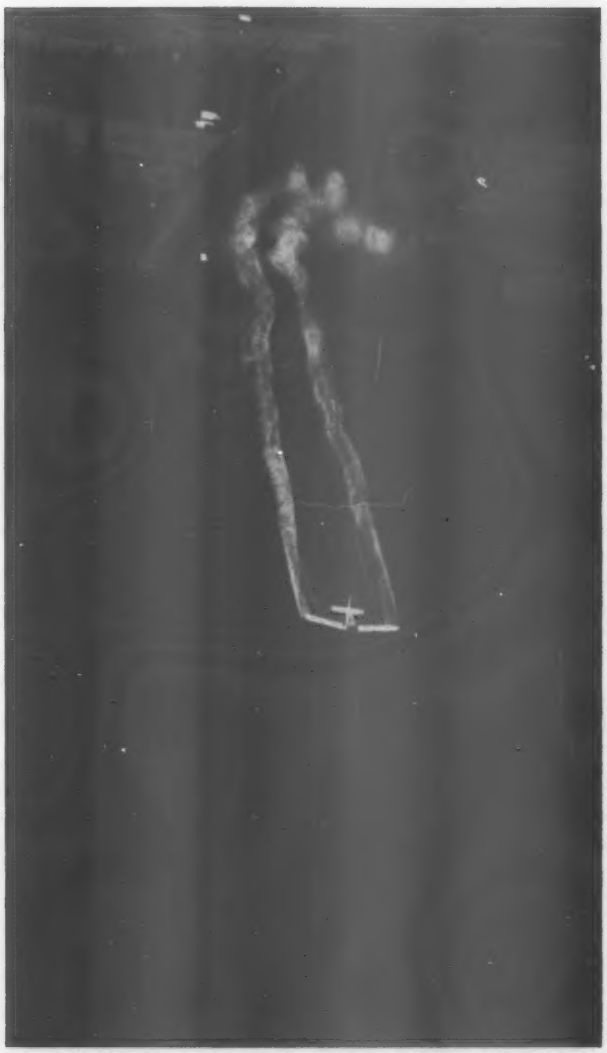
Mixing chemicals can be a hazardous operation. This man is wearing a respirator and rubber gloves, but must be careful to avoid getting spray mist on his body and arms which can be absorbed and, in severe cases, cause death.

Team of low-flying ap

FLYING ON THE DECK CALLS



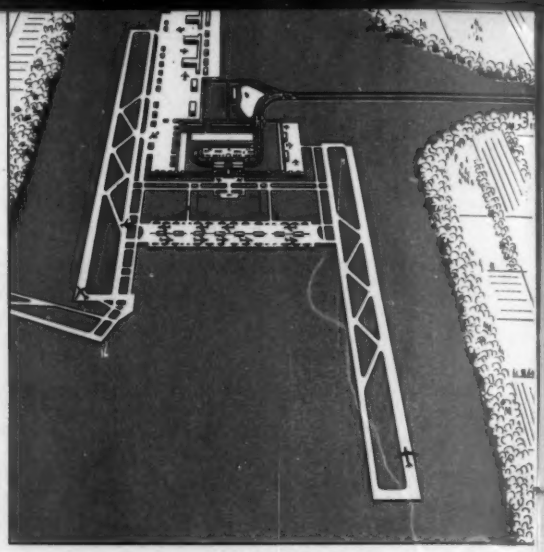
Above, Piper Pawnee. Below, Grumman Ag-Cat, designed after lengthy research on aerial applicator needs, has excellent forward visibility, 57 mph stall speed, aluminum fuel tank and cockpit stressed at 40 Gs.



Airplane spraying for spruce bud worm over national forest in Oregon.

flying applicators can swiftly blanket a field with pest-killing chemicals.

S FOR SKILL AND VIGILANCE



More Airports Needed to Meet Needs of Growing Civil Air Fleet

A total of 510 new airports—428 of them designed primarily for general aviation use—should be built as soon as possible to meet the growth of the nation's civil air fleet, FAA Administrator N. E. Halaby has reported to Congress.

In addition, improvements should be made to 2,613 existing airports if civil aviation is to achieve its full potential. This total includes both airline and general aviation fields. These projections were made in the 1962 National Airport Plan.

The report points out that last year the general aviation fleet—more than 75,000 airplanes—flew approximately three times as many hours and twice as many miles as the domestic certificated airlines. It estimates that the hours flown by general aviation will increase from 12.6 million in 1961 to 16.5 million in 1967.

A major recommendation is that 259 general aviation airports be developed specifically to relieve congestion at airline airports serving 59 major metropolitan areas. This development work would include both the building of new fields and modernizing existing ones.

The principal cause of airport congestion in these areas is the large scale mixing of airline, military and general aviation aircraft, the report says. It concludes that a practical solution to the problem would be to develop supplemental or "reliever" airports to siphon off much of the general aviation traffic.

For example, the report suggests that approximately 15 reliever airports should be developed for the Los Angeles-Long Beach area, 13 for the Philadelphia area, 12 for San Francisco-Oakland, 11 each for Pittsburgh and Chicago, 10 for Boston and 9 for New York City. (See box for complete listing.)

FAA's National Airport Plan for 1962 lists individual projects the Administrator considers necessary to provide an airport system capable of meeting current and anticipated needs of civil aviation. The plan, which covers a five-year period, is revised and submitted to Congress annually. The new plan covers the fiscal years 1963 through 1967.

Although no funds are provided for in the plan, it estimates the total cost of the recommended projects over the five years at $1.135 billion. This total includes both local, state and Federal expenditures.

A major purpose of the plan, Halaby said, is to supply information to help determine "the size, scope and relative importance of those airport projects which may be considered for a grant under the Federal-aid Airport Program."

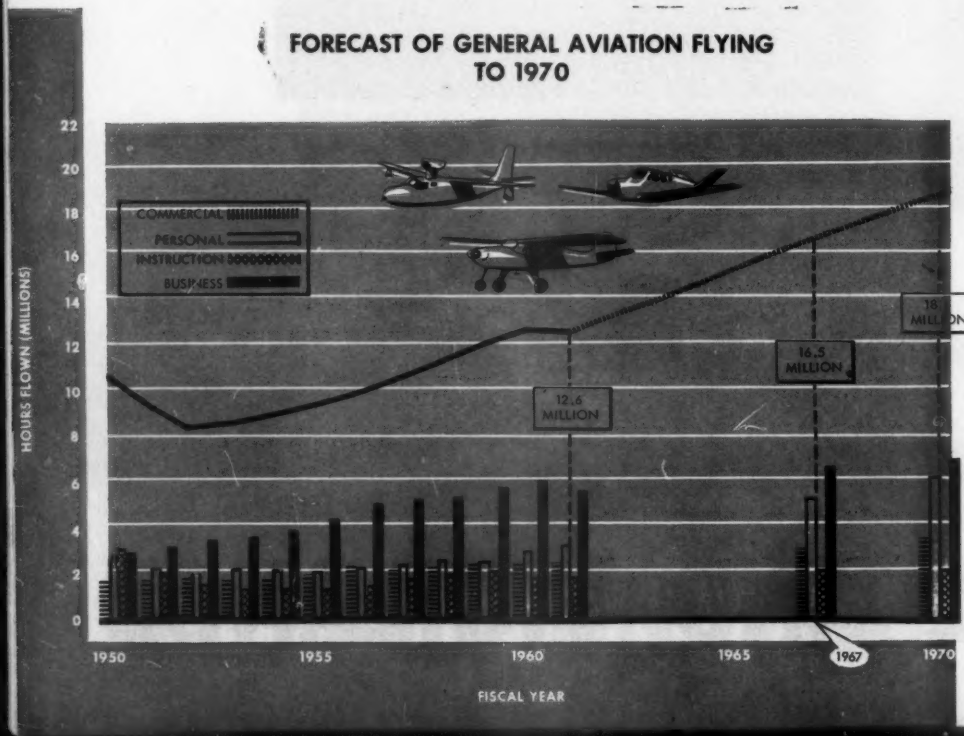
The listing of an airport in the plan makes it eligible for Federal funds but does not assure it of receiving aid. No airport can be considered for government assistance if it is not listed in the plan.

A total of $75 million already has been appropriated by the Congress for the Federal-aid Airport Program for fiscal 1963, and grants to individual airports will be announced by FAA this month. Of this money, $7 million is designated exclusively for development of general aviation airports, while the remainder may be awarded to either airline or general aviation fields.

In submitting the plan to Congress, Halaby emphasized the need for effective long-range planning in developing an airport system, pointing out that airports are dependent upon one another.

"Thus, to plan a meaningful national

FORECAST OF GENERAL AVIATION FLYING TO 1970



system of airports, the role of each facility must be evaluated and measured not only on its merits but in relation to others. To the extent possible, each must be planned to support and supplement the usefulness of the others so that, ideally, if all of the airports included in the National Airport Plan were developed in the time and manner prescribed, the system of public airports would be adequate in all respects," he said.

The need for general aviation airports is especially acute in Texas and California. The FAA recommends that 31 be built in Texas and 29 in California. North Carolina ranks third with 23, followed by Indiana and Mississippi with 18 each and Arkansas with 16.

Of the 86 new airline airports listed, 66 are proposed for Alaska, where the rugged terrain makes flying a way of life. Most of these would be small fields, however, designed to handle operators who haul passengers in general aviation-type aircraft but are nevertheless classified as air carriers. The runway requirements for the great majority of these fields would be less than 4,000 feet.

Alaska also leads in the number of airports requiring improvement with 193. Texas and California are next with 166 and 144, respectively. Other states ranking high on the list are Pennsylvania with 92, Minnesota with 87, Michigan and New York with 84 each, and Kansas and Wisconsin with 80.

Halaby pointed out, however, that airports are only one component of the national aviation system.

The airport "must be compatible with the en route navigation aids which guide aircraft between the terminus" and "must provide terminal navigation aids to safely accommodate the transition from en route altitude to ground," he said. In addition, "all of these components must complement the capabilities of the pilot, his aircraft and its airborne electronic equipment to safely utilize the system."

"In working toward such a system," Halaby observed, "we will bear in mind our responsibility to the whole public—the neighbors as well as the users of airports. We will also continue to recognize and foster local initiatives leading to fulfillment of local as well as regional and national requirements. Let the aviation community and the public know that the Federal Aviation Agency intends to provide the leadership and guidance necessary toward the ultimate attainment of these goals not only in the development of a national system of civil airports, but in all other segments of civil aviation."

Copies of the *National Airport Plan* are on sale for $2.25 at the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

METROPOLITAN AREAS REQUIRING AIRPORTS FOR CONGESTION RELIEF

(No. of Airports Required)

Albany, N. Y.	4	Fort Lauderdale, Fla.	3	Oklahoma City	4
Anchorage	1	Fort Worth	4	Omaha	1
Amarillo	1	Hartford, Conn.	5	Philadelphia	13
Atlanta	6	Honolulu	2	Phoenix	8
Baltimore	5	Houston	4	Pittsburgh	11
Birmingham	2	Indianapolis	1	Portland, Ore.	4
Boston	10	Jacksonville, Fla.	3	Rochester, N. Y.	2
Buffalo, N. Y.	5	Kansas City, Mo.	7	Sacramento	2
Charleston, S. C.	2	Knoxville, Tenn.	2	St. Louis, Mo.	6
Charlotte, N. C.	1	Las Vegas	1	San Antonio	1
Chicago	11	Los Angeles-Long Beach	15	San Diego	8
Cincinnati	2	Louisville	2	San Francisco-Oakland	12
Cleveland	4	Memphis	2	San Juan, P. R.	1
Columbus, Ohio	2	Miami	3	Seattle-Tacoma	8
Dallas	9	Milwaukee	4	Syracuse, N. Y.	4
Dayton, Ohio	3	Minneapolis-St. Paul	9	Tampa-St. Petersburg	4
Denver	4	Nashville	1	Toledo	1
Detroit	4	Newark, N. J.	2	Tucson	2
El Paso	1	New Orleans	2	Tulsa	3
		New York, N. Y.	9	Washington, D. C.	6

More Restricted Airspace Returned to Public Use

The FAA, in cooperation with military and other Federal government agencies, has returned 32,787 square miles of restricted airspace to public use in the three years ending May, 1962.

Three years ago restricted areas covered 148,850 square miles, of which 5,136 square miles were prohibited. The 116,063 square miles of restricted airspace still in effect are set aside for military and related purposes.

Restricted areas are located throughout the continental United States, Alaska, Hawaii, Guam and Puerto Rico. They are established in the interest of safety to segregate aircraft engaged in hazardous air activities, such as air defense missions, aerial bombing, rocketry, and air-to-ground firing, and from other aircraft, as well as to protect all aircraft from ground firing. Non-participating flights, including civil aircraft, may fly through these areas when they are not being used for the purpose designated upon prior approval from the appropriate using or controlling agency.

The present amount of restricted airspace is only a small percentage of the total national airspace. The significance of many restricted areas lies, however, in their location with respect to areas of overall density in air traffic.

In this connection, the FAA has under continuous review the use being made of the airspace with the objective of bringing about a fair airspace allocation for all users and a more efficient airspace use to meet civil as well as military requirements. Responsibility for airspace utilization was assumed by the FAA in May, 1959.

MAJOR NAVAIDS COMMISSIONED IN MAY

ILS (Instrument Landing System): Miami, Fla.

ALS (Approach Lighting System): Lake Charles, La.; Chicago (O'Hare)

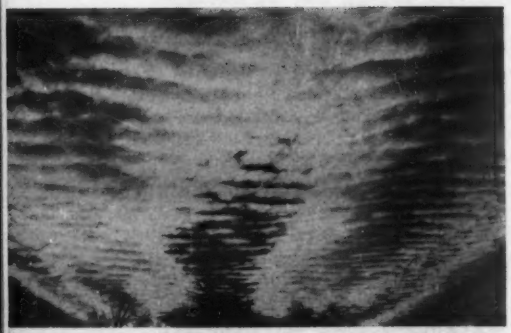
SFL (Sequenced Flashing Lights): Lake Charles, La.; Chicago (O'Hare)

Air Traffic Control Tower: Green Bay, Wis.; San Diego; Oshkosh, Wis.; Dallas-Red Bird

VASI (Visual Approach Slope Indicator): Miami, Fla.

TWEB (Transcribed Weather Broadcast): El Paso; Tulsa; Albuquerque; Pendleton, Ore.

Stratocumulus cumulogenitus—not dangerous while you can see 50 percent of the ground below.



Stratocumulus—a VFR pilot can easily lose his reference in solid clouds like these. Better stay underneath.

Cumulus congestus—look for thunderheads later on and fly around or below these.

Cumulus congestus and stratocumulus—time for a 180°. Building up to a thunderstorm. Rough and dangerous.

Don't Just Talk About

Clouds are signs in the skies which pilots must learn to read accurately as one important means of assessing potential hazards along their flight paths.

At one time or another, most pilots have cocked an eye at clouds like those shown here and pondered. Willingness to make a 180° turn at the right moment has brought many a potentially dangerous flight to a happy conclusion. Frequently, reluctance has brought disaster.

An FAA analysis of general aviation accidents shows that 30 percent of the 437 fatalities last year resulted from pilots taking off into, or continuing flight into, unfavorable weather conditions. Log books salvaged from the wreckage of some of these airplanes are mute evidence that the pilots had tried this before and won. But the time came when unfortunately they had used all their luck.

Today, when more VFR cross-country flights are being made than ever before, pilots need weather knowledge as well as weather information. They must learn to read cloud signs, to realize that weather does not always perform as predicted, that conditions can change quickly. Forecasts are as accurate as it is possible to make them, but forecasting is not an exact science. Weather is complex, ever changing and frequently manifests itself in forms that defy complete description.

To be safe, the VFR pilot needs references—an effective horizon, at least 50 percent air-ground visibility and sufficient forward visibility to avoid hitting anything. If he loses his references by flying into clouds either deliberately or inadvertently, he can lose control.

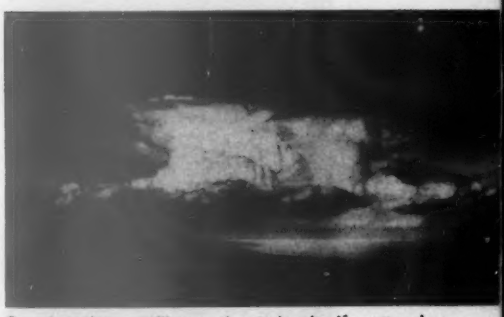
Altocumulus cumulogenitus—these mark the outer edges of a storm with bad weather ahead. Alter course or land.

Altocumulus castellatus—Rough, turbulent with plenty of vertical updrafts.

Lenticular cloud—denotes plenty of turbulence created by topography and high winds aloft. Stay away.

Low stratus—Ceiling is too low for safety.

the Weather–Learn It!



Cumulonimbus capillatus—thunderheads. If scattered, go around with caution, but watch your fuel.

Altocumulus translucidus—these form at 12,000-14,000 ft. Usually plenty of room beneath them.

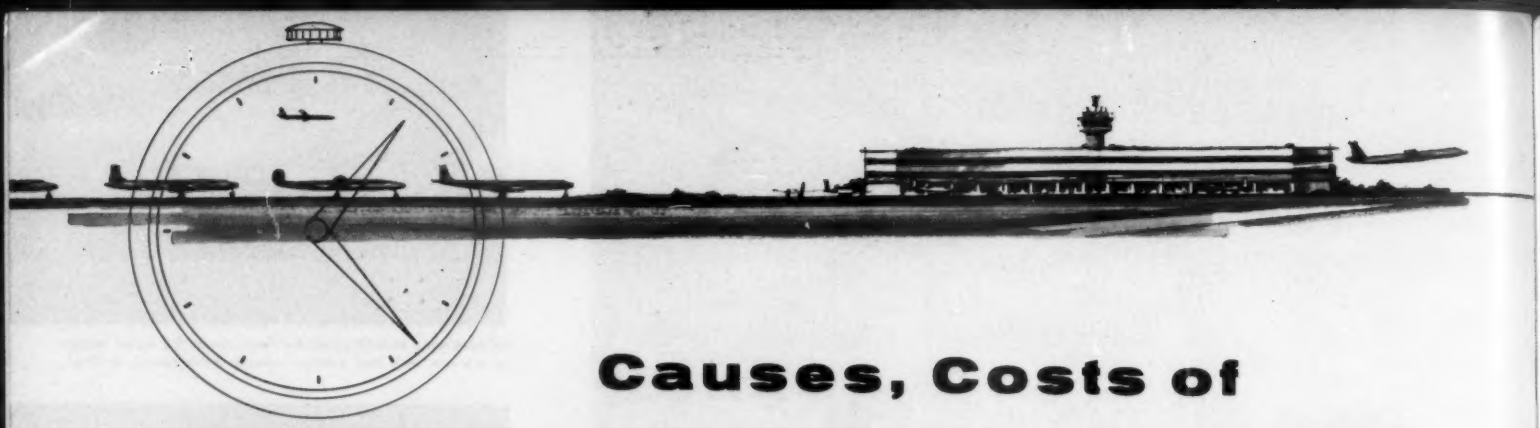
Clouds can be deceptive. They are not always what they seem to be from a distance. Flat bases turn out to be ragged and rough. Some hanging cloud fragments are big enough to envelop a small plane suddenly, completely and for long enough to result in calamity.

Every cloud formation has its own significance and there are infinite combinations and variations, all indicative of certain kinds of weather. Cumulus clouds are always moving—this means wind. Irregular clouds mean turbulence. Low clouds as a rule mean poor visibility due to haze, drizzle or rain. And whatever the reason, low clouds bring early darkness.

The pilot who flies under a low overcast will find considerable variations in the cloud heights, especially if the winds are light. Where the terrain is uneven the variation will be quite pronounced.

Because the modern light airplane is a traveling vehicle, meant to go places, it is being used more and more for business as well as pleasure flying. A cross country flight should not be undertaken casually. A call to the nearest FAA Flight Service Station, for a preflight check of the route and weather, is inexpensive insurance. There is an impressive amount of information to be had there, and pilots have free access to it for the asking.

Weather information also is important to navigation. Wind reports at a wide range of altitudes are available, as are wind forecasts for these altitudes. From these, the pilot can select his best cruising altitudes, and can compute his ground speeds and estimated times of arrival on various legs of his proposed trip.



Causes, Costs of Terminal Delays Studied by FAA

Total cost of terminal delays due to all causes at civil and military airports throughout the country is estimated at $624 million for fiscal year 1961, according to a recent FAA study.

The estimated annual cost of excessive delays—more than five minutes—is placed at $363.8 million. Approximately 10 percent is attributed to air traffic control.

No breakdown is given of other contributory causes—such as maintenance, weather, airline equipment, ramp congestion, runway and taxiway layout, etc.—because of lack of specific information.

The study, prepared by FAA's Air Traffic Service, is now being circulated for industry comment prior to further study of airport terminal delays and ways of making improvements.

It is the first comprehensive analysis attempted of the cost of terminal delays. Its primary objective is to determine the extent of air traffic control delay at air terminals showing significant total delay for whatever reason, and to find reasons and cures for traffic control delays.

The greatest delays, the study reveals, occur at airports handling the heaviest traffic loads. Fourteen of the 245 high density airports analyzed—little more than half-a-percent—account for 25 percent of the total delay time. These airports are Idlewild, Washington National, Los Angeles, Newark, LaGuardia, Atlanta, Pittsburgh, Boston, Cleveland, Miami International, St. Louis, San Francisco, Philadelphia and Dallas Love.

Of the 245 high density airports analyzed, 108 are military bases. They account for approximately 27 percent of total delay time.

The study analyzes IFR peak day data and flight plan information filed by Air Route Traffic Control Centers and airport towers. Elapsed times between scheduled departures and actual takeoffs are itemized for 19,837 departures at 1,128 airports. Based on peak day data only, these times total approximately 3,120 hours. The study converts peak day data to an annual total average of 1,380,000 hours lost due to terminal delays of all kinds.

Total annual gross cost is derived from computing average hourly operating costs for five categories of aircraft by airport and type of aircraft.

The five aircraft categories—determined from flight plans filed at the 245 high density airports—and their average hourly operating costs, are: turbojets—$900; turboprops—$500; four-engine piston—$475; two-engine piston—$180; and one-engine piston—$40.

Of the 1,128 airports analyzed, the 245 account for 83.8% or 2,614 hours of delay. On this basis, the estimated annual gross cost of delay for the 245 airports is figured at a total of $523,019,880, divided as follows by category of aircraft: jets—$236,082,600; turboprops—$53,320,000; four-engine—$153,934,200; two-engine—$78,609,960; one-engine—$1,073,120.

The balance of the $101 million making up the total gross cost is attributed to the 883 low traffic density airports. On the average, 7.8 minutes is estimated per departure for these airports in contrast to an average of 13.75 minutes of delay per departure for the 245 high traffic density airports.

The study assumes that the 883 light traffic airports have no critical congestion or traffic delay problems. Therefore, an elapsed time of about five minutes would be a reasonable, conservative average delay. On the basis of this reasoning, the study makes the further assumption that delay in excess of five minutes—or 8.75 minutes in the case of the 245 busy airports—would be due to airport congestion and air traffic control resulting from multiple arrivals and departures.

RETIRED PILOT FINDS NICHE AT FAA

From the left seat to the third seat and sometimes in the right seat (above, right) *summarizes the recent aviation activity of Joseph E. Ohrbeck, former airline pilot who retired under FAA's age 60 retirement regulation and is now working for FAA as an air carrier inspector in Anchorage. He is one of seven former airline captains who made the transition about a year ago. Ohrbeck brings to FAA 43 years of invaluable experience, from barnstormer to captain for Northwest Airlines.*

Letters to the Administrator

Over the past year, the FAA has been working hard to improve relations and establish better communications with the aviation community. Administrator N. E. Halaby recently wrote a letter to airmen as part of this effort to report on FAA programs and their progress. Among the responses were the airmen comments published here.

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. Please keep them brief. No anonymous letters will be used, but names will be withheld on request.

• Private Pilot Speaks Up

More and more I see towers giving preferential treatment to larger airplanes. Moreover, itinerant pilots who are unfamiliar with an area don't always savvy towers that say, "Report over the fairgrounds or Ford plant or Fox." Also, it costs as much [for an annual inspection] to license a $600 putt-putt as a $7,000 dream. Why?

Federal money—lots of it—goes into air terminals. How about some $5,000 Federally-owned sod strips to teach our kids to fly at a fair price?

C.M.J.
San Jose, Calif.

The only time preferential tower treatment should be accorded is in an emergency. Under normal procedure, clearances are given on a first-come, first-served basis. If an airplane is not equipped with two-way radio, however, then you might expect a delay until it is fitted into the traffic pattern. Tower phraseology is supposed to be standardized, although there may be conditions peculiar to an area that could result in some changes in tower communications. The local references are meant to save time for everybody, but controllers should use miles and direction after they realize that a pilot isn't familiar with the neighborhood. As far as annual inspection fees are concerned, look at it this way: The life of a man who flies a $600 airplane is no less important to FAA than the man who flies the $7,000 dream. We share your feelings on the importance of the small airport. FAA was instructed by Congress to allocate at least $7,000,000 of this year's appropriation for small airports. We actually allocated $12,000,000.

• Tall Tower Transmitters

In view of the recent accident near Chippewa Falls, Wisc., in which five Madison men lost their lives in a collision with a television tower, I submit the following for your consideration:

I believe it to be technically and economically feasible to equip each tower or other obstruction with a single channel, crystal-controlled transmitter, similar to the Unicom transmitters. These would transmit a distinctive signal continuously. The range would be in the neighborhood of five to ten miles.

Edwin S. Kennedy
Madison, Wisc.

The idea of placing radio transmitters on television towers and other high obstructions has been considered for many years. The technical and cost problems involved, coupled with marginal reliability factors, have resulted in rejection of this proposal each time it has been considered. In addition, even though new techniques and recently developed radio equipment would enhance the feasibility of this suggestion, it would be extremely difficult to implement because of the problems involved in equipping and maintaining transmitters for all tall obstructions and requiring additional radio in aircraft.

• Landing Fees

The only desire that goes through my mind at this time is to get a change in the landing fee for the pilot going to and from Chicago. This landing fee is unfair and is an imposition on the taxpayer who is using the facilities.

Thomas E. Garry
Beloit, Wisc.

FAA has no responsibility for establishing landing fees. This is purely a function of the local airport operating authority.

• Armed Forces Navigators

Is it possible for FAA to issue flight navigator licenses to Armed Forces navigators who present a certified record of flying time and successfully complete a written examination, comparable to the military competence issurance for pilot certificates?

I am an FAA pilot and SAC navigator on a KC-135 jet. There are many SAC navigators equally anxious to hear of your actions.

Neal S. Roark
Captain, USAF (SAC)
Altus, Okla.

Due to different standards followed in designating flight navigators, and the difference in training programs employed by the various military establishments, FAA could not be assured that standards equivalent to those required by the Civil Air Regulations for the issuance of flight navigator certificates would be met. Studies indicate that to issue flight navigator certificates on the basis of military competence with only the satisfactory completion of an abbreviated written examination of the Civil Air Regulations, as you suggest, would not be in the best interest of the public. FAA will continue to study the matter and will officially recognize military experience insofar as it is practical and consistent with its responsibilities under the Federal Aviation Act.

• Ejectible Cockpit Recorder

Has anyone developed an ejectible cockpit voice recorder? It seems to me that since a Boeing 707 costs so much, any small safety device or recorder would be worth many times its cost—and lives. A cabin monitor recorder system would be a good idea, too.

Where is development done, by the way? Some interesting ideas along these lines keep recurring.

E.D.H.
Arcadia, Calif.

We have presently under evaluation a prototype cockpit voice recorder developed under contract with United Data Control, Inc., El Monte, Calif. This program is designed to determine whether the recorder can withstand the rigors of aircraft crash and yet provide an intelligible recording of cockpit voice conversation and air-to-ground communications. Later we intend to evaluate in a similar test program other recorders produced by Fairchild Camera and Instrument Corp., Lockheed Aircraft Service, Inc. and Spec Tool Company.

• Standby Transmitters

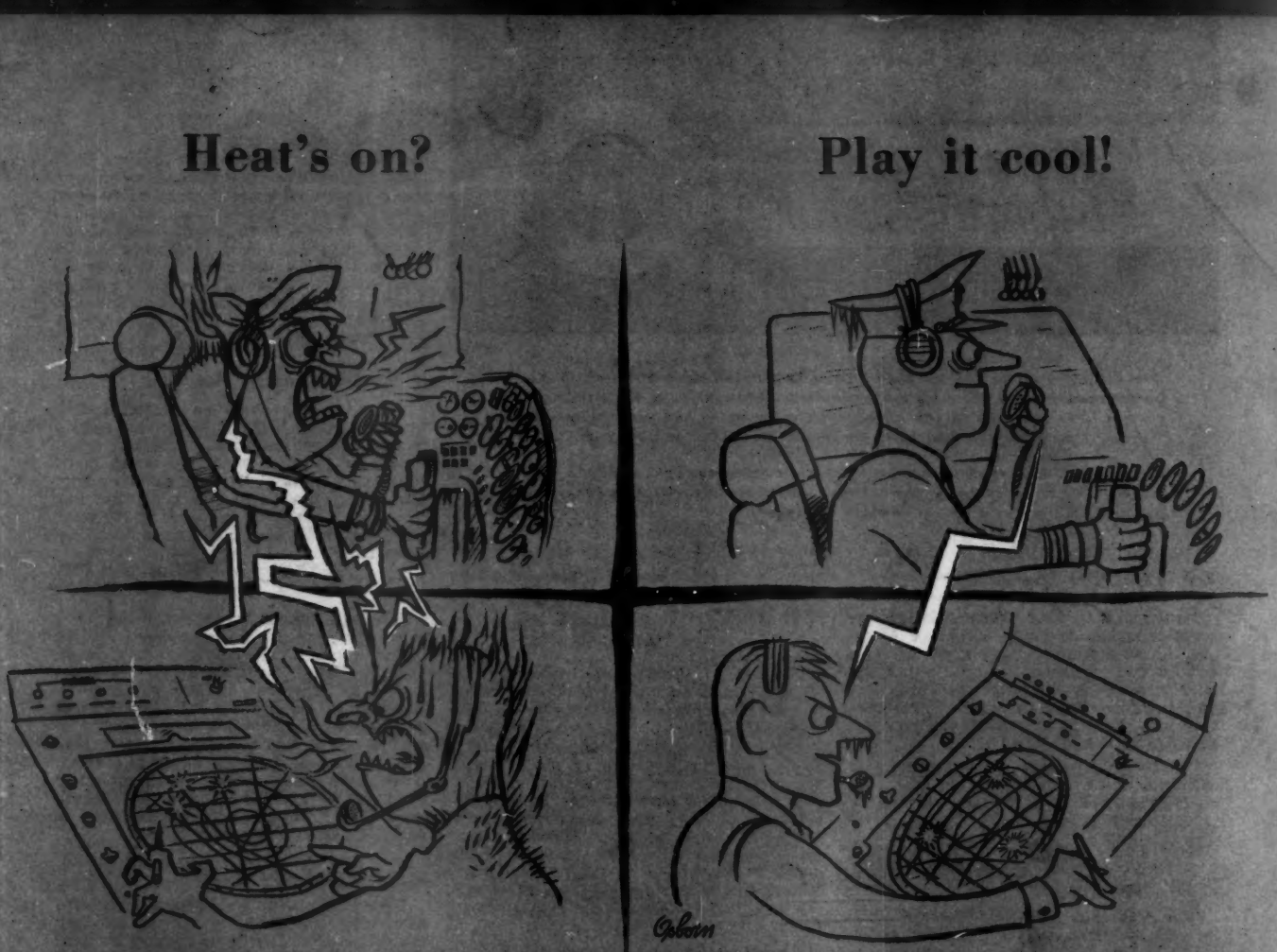
I would like to go on record as favoring a new rule requiring the standby or auxiliary transmitter in aircraft to be in operating condition in the event that instrument flight is to be conducted. One way of determining whether standby gear is functioning is to include a check on Ground Control in case a flight is departing from a controlled airport. If not, the standby transmitter can be checked with the Flight Service Station. If the standby transmitter is found to be inoperative or functioning improperly, the instrument flight would be in violation.

In short, for the safety of all concerned, should the primary transceiver fail, the standby transmitter utilized with an omni receiver may well relieve the problems that arise in the air and on the ground as a result of no communication with aircraft on an instrument clearance during inclement weather.

Jack K. Wussow
Rockford, Ill.

FAA does not propose at this time to require serviceability checks for non-required equipment, although we are considering suggestions that such equipment should be marked when it is out of order. This would apply particularly to rental aircraft and other aircraft used commercially or operated by different pilots.

All too often, pens cartoonist Robert Osborn on the next page, airmen forget that although the realm of flight is immense, it is not big enough to overlook the problems of the other guy—at least not if aviation is to progress in safety.



With IFR, who needs another needle?

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